

Research Article

Ethical Considerations in AI and Information Technology Privacy and Bias

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ABSTRACT

Concerns about prejudice and privacy have become crucial ethical issues as information technology (IT) and artificial intelligence (AI) are increasingly integrated into society. Large volumes of demographic data are processed by AI systems, which frequently pose privacy problems and reinforce prejudices, especially those related to age and gender. This paper explores these ethical issues, concentrating on the effects of biased AI-driven decision-making on facial recognition, healthcare, and employment. This study uses a mixed-methods approach, combining quantitative data from 60 respondents with qualitative literature analysis. The results show a strong relationship between ethical concerns, privacy issues, and biased data gathering. Disenfranchised groups continue to be disadvantaged by AI models based on historically skewed datasets, which exacerbate discrimination and restrict justice in digital decision-making. Even though laws like the CCPA and GDPR offer some control, they are not enough to handle the growing ethical issues surrounding AI. Reducing discrimination and guaranteeing accountability requires using bias detection techniques, fairness-aware machine learning, and transparent AI governance. Giving ethical issues a top priority as AI develops will be essential to creating technology that upholds individual liberties and promotes inclusivity. To guarantee a fair and just technological environment for all users, future developments in AI must concentrate on creating equitable systems that protect privacy.

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1. Introduction

Concerns about prejudice and privacy have become critical issues at a time when information technology (IT) and artificial intelligence (AI) are pervasive in daily life. As artificial intelligence (AI) systems develop, they handle enormous volumes of human data, including private demographic information like gender and age (Reddy et al., 2024). These developments provide enormous ethical problems concerning bias, discrimination, and data privacy even as they provide hitherto unheard-of levels of convenience and efficiency. This essay examines the moral ramifications of AI and IT concerning gender and age privacy, highlighting the need to provide protection, equity, and openness in digital spaces. AI-driven technologies raise serious privacy issues as businesses gather and examine enormous amounts of data for decision-making (Shukla

& Taneja, 2024). Essential concerns regarding user privacy and permission are brought up by AI's capacity to deduce personal characteristics like age and gender, even from data that seems to be anonymized. To safeguard people against exploiting their personal information, businesses and developers must put strict regulations and ethical frameworks into place. AI systems frequently function in ways that conceal their decision-making processes, resulting in unintentional privacy violations, even despite efforts to control data gathering through laws like the California Consumer Privacy Act (CCPA) and the General Data Protection Regulation (GDPR) (Ikwuanusi et al., 2023).

Bias is one of the main ethical issues with AI-based information processing, and it may have a big influence on how gender and age are reflected in data-driven choices. Unrepresentative or historically biased training

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data can introduce bias into AI, producing results that disproportionately impact particular demographic groups (Varona & Suárez, 2022). Age-related biases in AI-driven financial or healthcare systems might lead to discriminatory outcomes for older people, while biased recruiting algorithms may prefer one gender over another based on previous employment trends (Chu et al., 2022; Naik & Nushi, 2023). These prejudices erode public confidence in AI technology in addition to perpetuating current societal injustices. A balanced approach to AI development is required due to the junction of privacy and prejudice, which ensures that systems respect individual liberty while reducing biased inclinations. Strong data governance guidelines, bias detection tools, and inclusive dataset-gathering procedures that prevent discriminatory results are all necessary for ethical AI design (Gichoya et al., 2023; Ikwuanusi et al., 2023). Organizations must also promote algorithmic transparency by providing people with the opportunity to challenge biased results and by clearly explaining AI-driven decisions (Verma et al., 2024).

As AI and IT continue to develop, it is crucial to address ethical concerns related to prejudice and privacy. In addition to being required by law, protecting age and gender privacy in AI systems is also morally required to preserve justice and individual liberties in the digital era (Kubanek & Szymoniak, 2024). Society may advance toward a future where technology benefits everyone equally while protecting their privacy by using moral AI practices and managing data responsibly (Garg, 2024). To emphasize the dangers of privacy violations and biased decision-making, this study will examine the ethical aspects of age and gender privacy in AI and IT. It will examine how ethical AI concepts may be used to protect personal data and promote fair treatment for various demographic groups by reviewing the body of current literature, case studies, and policy frameworks. This paper aims to add to the ongoing conversation on responsible AI development by highlighting the significance of privacy-preserving AI approaches including differential privacy, fairness-aware machine learning, and regulatory compliance.

2. Literature review

Artificial intelligence (AI) is increasingly being used in public sector decision-making as an efficient method for optimizing service delivery. However, the introduction of AI has raised concerns about the potential negative effects of gender bias. This paper explores the relationship between AI and gender bias, analyzing the perpetuation and mitigation of biases. It categorizes AI technologies based on text or image input, revealing the potential for AI to amplify existing human bias. The paper calls for collaboration between scholars from technology, gender studies, and public policy to fully explore algorithmic accountability and the potential consequences of AI technologies (O'Connor & Liu, 2024). The rapid development of artificial intelligence

(AI) systems has raised concerns about the inherent biases inherent in AI algorithms. This has led researchers to focus on Responsible and Explainable AI, particularly in facial expression recognition. This research investigates gender bias in deep learning methods for facial expression recognition by examining six distinct neural networks and analyzing their presence. The results reveal that more biased neural networks show a larger accuracy gap in emotion recognition between male and female test sets, with true positive and false positive rates. The research also reveals which types of emotions are better classified for men and women. As the topic of biases in facial expression recognition is not well-studied, further research is needed to analyze state-of-the-art methods and target other biases (Domnich & Anbarjafari, 2021).

The integration of AI in language education has brought about significant ethical implications. The use of ChatGPT, a sophisticated language model developed by OpenAI, raises questions about privacy, bias, reliability, accessibility, authenticity, and academic integrity (Martin et al., 2022). These ethical considerations must be carefully monitored to ensure the responsible use of AI in language education. By understanding these implications, educators, students, and administrators can make informed decisions about the appropriate use of AI in language education, ensuring its ethical and responsible use. As AI advances at an unprecedented rate, educators and administrators must remain vigilant in monitoring these ethical implications (Vaccino-Salvadore, 2023). Ethical issues surrounding the use of artificial intelligence (AI) in healthcare are a growing concern, with concerns about privacy, surveillance, bias, and the role of human judgment. AI can lead to inaccuracies and data breaches, particularly in healthcare settings where mistakes can have devastating consequences for patients. Currently, there are no well-defined regulations to address these issues, and it is crucial to prioritize algorithmic transparency, privacy, and protection of all beneficiaries involved. Cybersecurity of associated vulnerabilities is also essential to ensure the safety and security of AI systems (Naik et al., 2022).

The information system (IS) field is recognizing the importance of AI-based outcomes, but there is a lack of research on managing gender bias in AI-based decision-making systems. This study aims to address this gap by conducting a systematic literature review and proposing a theoretical framework for managing gender bias in AI-based systems. The review identifies gender bias as a socio-technical problem and proposes a theoretical framework that combines technological, organizational, and societal approaches. The paper also presents four propositions to mitigate biased effects and considers future research in the organizational context (Nadeem et al., 2022). AI ageism is a phenomenon where practices and ideologies exclude, discriminate, or neglect the interests, experiences, and needs of older populations. This exclusion can be manifested in five interconnected

forms: age biases in algorithms and datasets (technical level), age stereotypes, prejudices, and ideologies of actors in AI (individual level), invisibility of old age in discourses on AI (discourse level), discriminatory effects of use of AI technology on different age groups (group level), and exclusion as users of AI technology, services, and products (user level). This paper provides empirical illustrations of how ageism operates in these five forms (Stypinska, 2023).

AI and machine learning are promising solutions for improving healthcare infrastructure in Low- and Middle-Income Countries (LMICs), but they should be used cautiously to avoid bias and algorithmic bias. LMIC populations are particularly vulnerable to bias and fairness in AI algorithms due to a lack of technical capacity, social bias against minority groups, and lack of legal protections (Wan et al., 2023). To evaluate the use of AI and machine learning systems, three basic criteria (Appropriateness, Fairness, and Bias) should be considered: appropriateness, bias, and fairness. Appropriateness involves matching the machine learning model to the target population, bias is a systematic tendency favoring one demographic group, and fairness involves examining the impact on various demographic groups and choosing mathematical definitions that satisfy legal, cultural, and ethical requirements. These principles can guide researchers and organizations in global health (Fletcher et al., 2021). AI's advancements in healthcare decision-making and medical diagnosis have raised concerns about the fairness and bias of AI systems. This is particularly critical in areas like employment, criminal justice, and credit scoring. Generative AI models (GenAI) produce synthetic media, which can lead to unfair outcomes and perpetuate existing inequalities. This survey study provides a comprehensive overview of fairness and bias in AI, addressing their sources, impacts, and mitigation strategies (Giovanola & Tiribelli, 2023). It reviews sources of bias, such as data, algorithms, and human decision biases, and highlights the emergent issue of generative AI bias. The study assesses the societal impact of biased AI systems, focusing on perpetuating inequalities and reinforcing harmful stereotypes. Mitigation strategies include data pre-processing, model selection, and post-processing. Addressing bias in AI requires a holistic approach involving diverse datasets, enhanced transparency and accountability, and exploring alternative AI paradigms that prioritize fairness and ethical considerations (Ferrara, 2024).

The use of AI in several fields poses questions regarding ethical consequences, privacy, gender prejudice, and fairness. Research reveals biases in decision-making, healthcare, language instruction, and facial recognition. To address AI bias, interdisciplinary cooperation, openness, equity, and legal frameworks are necessary to reduce disparities and guarantee the responsible, moral employment of AI in a range of applications. Through an analysis of case studies, policy frameworks, and new research, this study investigates the ethical implications

of age and gender privacy in AI and IT. By highlighting the significance of privacy-preserving strategies like regulatory compliance, differential privacy, and fairness-aware machine learning, it seeks to support responsible AI development by protecting personal data and advancing fair treatment for a range of demographic groups.

3. Material and methodology

The many phases and procedures necessary for analyzing the data being collected from its various sources make up research methodology. The primary quantitative data was collected from 60 individuals to complete the study. The qualitative data was gathered from various research papers and journals. The gender was expected as male, female, and others. The age group was grouped as preteen, teen, youth, and experienced adult. Random sampling was used to choose the respondents, and positivism as a research theory was used to analyze the collected factual data. Fig. 1 is the methods used for research.

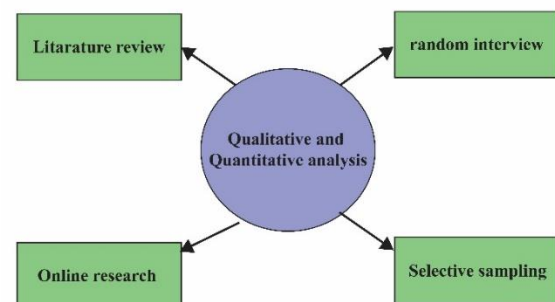


Fig. 1. Various research methods for this study.

Depending on the requirements and objectives of the research, a study may employ one of two distinct research methodologies, namely the deductive and inductive techniques. The deductive research technique was applied in this instance, and the resulting hypotheses were examined. By integrating the deductive research technique, the similarities and patterns found within the variables are made possible. On the other hand, using statistical analysis, the main data evaluation aids in producing numerical findings. The statistical knowledge of the link between the components of research may be expanded in this way. The study developed four alternative hypotheses. Table 1 is a representation of 4 possible hypotheses.

Table 1. Possible alternative hypotheses for research conclusion.

Reason of hypotheses	Hypotheses	Relation
Qualitative and quantitative analysis	H1	There is a strong link between biased data collection and ethical considerations

	H2	Lack of privacy is strongly linked to ethical and data collection
	H3	Responsible AI accountability is strongly associated with ethical and data collection
	H4	Lack of transparency is strongly linked to ethical and data collection considerations

4. Results and discussion

After all sorts of data collection, Missing value analysis (MVA) was used to analyze the data to find any missing information and preserve all observations. With a threshold of 3.90, the Mahalanobis technique was employed to check outliers. All observations were kept for additional research because the multivariate analysis revealed no outliers. Additionally, the data was examined for linearity, homoskedasticity, and normality using multivariate approaches. Although the data was not completely normally distributed, the key findings were unaffected by bigger samples that deviated from the normal distribution in terms of symmetry and roundness. The maximum likelihood approach, which is resistant to data departures from multivariate approaches' assumptions of normality, was applied. The sample had 60 observations, allowing for the use of data without alteration, and the approach was regarded as quite trustworthy.

Via data sorting and analysis, the results for 60 individual samples are shown in two tables: Table 2 for gender and Table 3 for age group-based data sorting. The data represented in the tables were collected from random interviews and selective sampling.

Table 2. data sorting by gender.

Gender	Frequency	Percent
Male	27	45.0
Female	25	41.7
Others	8	13.3

Table 3. Data soring based on age group.

Age group	Age range	Frequency	Percentage
G1	Under 13	7	11.7
G2	13-19	20	33.3
G3	20-30	24	40.0
G4	above 30	9	15.0

Data from random interviews and selective sampling were considered data for quantitative analysis. For qualitative analysis, we used online research and literature review from research journals. From the information collected, several key points have come to light which are discussed as:

4.1. Gender bias in AI:

Gender bias in AI is a serious issue that has an impact on people in many ways, especially in social, professional, and healthcare settings. Historical datasets used to train AI models frequently reflect cultural prejudices, which might result in discrimination against genders. Fig. 2 Shows Ethical AI policies for different genres.

- **AI in recruiting Practices:** In fields where males have historically held a strong position, it has been discovered that AI-driven recruiting tools give preference to male applicants over female ones. An AI system may reinforce rather than address gender discrepancies if it is trained on historical hiring data that shows them.
- **Gender Bias in Healthcare:** AI systems used to predict diseases and suggest treatments have demonstrated biases in identifying medical conditions based on a person's gender. This could result in incorrect diagnoses or insufficient treatment plans for women, non-binary people, and other gender minorities.
- **Biases in AI Assistants and Facial Recognition:** Research has indicated that facial recognition technology exhibits gender biases as well, misidentifying women and people with darker skin tones more frequently than men with lighter skin tones. Because inaccurate identification may lead to unjustified surveillance, discrimination, or exclusion from necessary services, such biases may result in privacy violations. Additionally, traditional gender stereotypes are reinforced by the fact that virtual assistants and AI-generated voices are frequently programmed with feminine-sounding voices and submissive traits.

4.2. AI Privacy and Bias across Different Age Groups

From social media and education to healthcare and banking, artificial intelligence (AI) technologies are increasingly integrated into various aspects of life. However, there have been complaints about bias and privacy, particularly regarding specific age groups. Fig. 3 shows AI privacy and information policy for all age groups. Large volumes of data are frequently gathered and analyzed by AI systems, and the processing of this data can have an unequal effect on users according to their age.

Ethical Considerations in AI Development: Venn Diagram

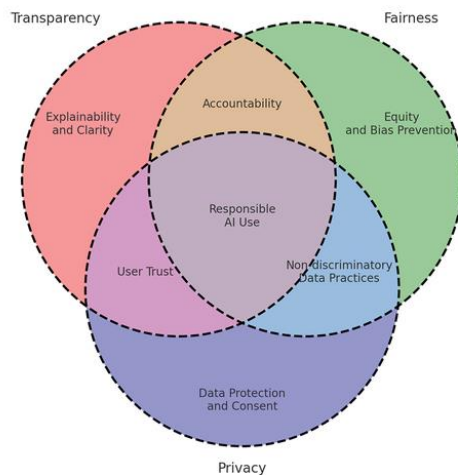


Fig. 2. Ethical AI policies for different genres (Radanliev, 2025).

- **Impact on Younger Users:** Because they may not fully understand data privacy policies or the ramifications of providing personal information online, younger users especially children and teenagers are more susceptible to privacy breaches. Numerous artificial intelligence (AI)-powered platforms, including social media and online gaming, gather behavioral information on younger users. This information may be used for targeted advertising or even pose a danger of identity theft and online harassment. Additionally, due to a lack of past performance data, AI-driven decision-making in school and employment recruitment may discriminate against younger applicants while favoring older, more seasoned candidates.
- **Difficulties for Elderly Users:** On the other hand, privacy and prejudice in AI present serious difficulties for older people as well. Many AI systems might not be properly trained on data from older demographics, especially in the healthcare and customer service industries, which could result in erroneous predictions and suggestions. For example, if training data sets are mostly composed of younger people, AI in healthcare might not be able to accurately diagnose elderly patients. Furthermore, while using AI-driven services, older people are more vulnerable to scams and privacy violations since they frequently lack the technological literacy necessary to use these services. These prejudices have the potential to exacerbate social inequality across age groups by erecting obstacles to digital involvement.

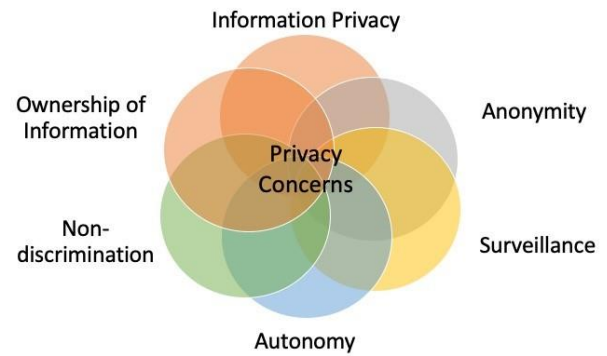


Fig. 3. AI privacy and information policy for all age groups.

5. Conclusion

Fairness, privacy, and openness in digital systems are all dependent on the ethical issues surrounding information technology (IT) and artificial intelligence (AI). In addition to posing serious privacy issues, this study demonstrates how AI-driven decision-making can reinforce age and gender bias. The data study shows that ethical concerns in AI are closely related to biased data gathering, privacy violations, and a lack of transparency. The study highlights how AI systems that are trained on historically uneven datasets tend to favor some groups over others, therefore perpetuating societal inequality. Existing disadvantages are exacerbated by gender bias in AI hiring, healthcare advice, and facial recognition systems, which poses a systemic challenge. The study also demonstrates how AI technologies affect various age groups, with older users experiencing biases as a result of insufficient representation in AI training datasets and younger users encountering privacy problems due to their lack of awareness.

The statistical investigation emphasized the necessity for stringent regulatory measures and ethical AI frameworks by confirming the existence of biases in AI decision-making. Organizations must use bias detection technologies, promote inclusive dataset gathering, and improve AI system transparency to lessen these problems. To guarantee fair treatment across demographics, responsible AI development should incorporate privacy-preserving strategies, machine learning that considers fairness, and regulatory compliance. To safeguard people's rights and promote confidence in AI systems, ethical issues must continue to be at the forefront of technological developments as AI develops. Society may strive toward an AI-driven future that is equitable and considerate of personal privacy by tackling these issues.

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